

Appln No. 10/733,823

Amdt date November 7, 2005

Reply to Office action of September 6, 2005 and October 5, 2005

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. Cancelled.

2. Cancelled.

3. Cancelled.

4. Cancelled.

5. Cancelled.

6. Cancelled.

7. (Previously presented) An apparatus for correcting an algebraic-coded message comprising:

a message receiver receiving a syndrome polynomial of the algebraic-coded message, the syndrome polynomial including redundancies usable to determine an existence of errors, a location and magnitude of errors and discrepancy values;

a plurality of polynomial storage devices being adapted to store polynomials;

a plurality of discrepancy value storage devices being adapted to store discrepancy values;

Appln No. 10/733,823

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one or more arithmetic-logic components, operably connected to the polynomial storage devices, the discrepancy value storage devices, and the message receiver; and

an inversionless calculator, operably connected to the polynomial storage devices, the discrepancy value storage devices, the message receiver, and the arithmetic-logic components, the inversionless calculator correcting errors in the algebraic-coded message performing inversionless calculations using the syndrome polynomial and using the polynomial storage devices to store different states of progress of the inversionless calculations and the discrepancy value storage devices to store discrepancy values discovered in the algebraic-coded message;

a binary state storage device being adapted to store a binary state, operably connected to the inversionless calculator and the arithmetic-logic components; and

an uncorrectable error indicator, operably connected to the inversionless calculator and the arithmetic-logic components, the inversionless calculator iterating through the location of errors in the algebraic-coded message, while:

determining the existence of errors, the location and magnitude of the errors and the discrepancy values in the algebraic-coded message,

storing a state variable in the binary state storage device before a first iteration to indicate that no uncorrectable error has been detected and iterating through the errors while updating the state variable to indicate whether an uncorrectable error has been detected,

Appln No. 10/733,823

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using the uncorrectable error indicator to indicate that the algebraic-coded message is uncorrectable if the state variable contains an indication that an uncorrectable error has been detected after a final iteration, and

using the uncorrectable error indicator to indicate that the algebraic-coded message is not uncorrectable if the existence of no errors has been determined or the state variable contains an indication that no uncorrectable error has been detected after the final iteration.

8. Cancelled.

9. (Previously presented) The apparatus of claim 7, wherein the inversionless calculator temporarily stores the discrepancy values in a first discrepancy value storage device of the plurality of discrepancy value storage devices and a second discrepancy value storage device of the plurality of discrepancy value storage devices, storing in the second discrepancy value storage device temporarily the last value previously stored in the first discrepancy value storage device.

10. (Previously presented) The apparatus of claim 7, wherein the binary state storage device is adapted to store a Boolean variable.

11. (Previously presented) The apparatus of claim 7, wherein the plurality of polynomial storage devices is three.

Appln No. 10/733,823

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12. (Previously presented) The apparatus of claim 11, wherein the first polynomial storage device stores the current state of progress of the inversionless calculations;

the second polynomial storage device stores a resulting state of the current inversionless calculations useable in a next iteration of the inversionless calculator; and

the third polynomial storage device stores a previous state of the inversionless calculations.

13. Cancelled.

14. Cancelled.

15. Cancelled.

16. Cancelled.

17. Cancelled.